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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,508	12/22/2003	Guoyu (David) Hu	1391-44200	8171

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EXAMINER

JACKSON, TYRONE D

ART UNIT PAPER NUMBER

2862

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/743,508	Applicant(s) HU ET AL.	
	Examiner Tyrone Jackson	Art Unit 2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-32 and 34-36 is/are rejected.
- 7) ☒ Claim(s) 10 and 33 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/22/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/22/2003</u> <u>09/27/04 TJ</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

Claim 14 is objected to because of the following informalities: The term "electrodes" is included twice erroneously. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Zoltan et al. (5,049,822).

Regarding claim 1, Zoltan et al teaches a microresistivity device used to make measurements in boreholes comprising a set of concentric electrodes, with the set including a first electrode, a second electrode, a third electrode, a fourth electrode, a fifth electrode, and a sixth electrode, wherein the first electrode lies inside the second electrode, the second electrode lies inside the third electrode, the third electrode lies inside the fourth electrode, the fourth electrode lies inside the fifth electrode, and the fifth electrode lies inside the sixth electrode (column 10 lines 8-12, Fig. 2).

Regarding claim 11, Zoltan et al. teaches a microresistivity device comprising a pad 6 suitable to be pressed against a borehole wall (column 9 lines 41-42), with the

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first electrode, the second electrode, the third electrode, the fourth electrode, the fifth electrode, and the sixth electrode all located on the pad (column 9 lines 33-36).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 30, 32, 34 and 36 are rejected under 35 U.S.C. 102(a) as being anticipated by Ritter et al. {US Pub 2005/0001624}.

Regarding claims 30, 34 and 36 Ritter et al. teaches a method to determine a flushed zone resistivity behind a borehole wall formed by a borehole (page 2, para 13, lines 24-27, page 4, para 43, line 32) comprising inserting a resistivity measurement device into the borehole, measuring resistivities at different distances, which would reasonably encompass up to six distances (page 4, para 43, lines 27-28), and calculating the flushed zone resistivity from the measured resistivities by use of inversion (obtains resistivity from voltage and current measurements due to $V=IR$, page 4, para 43, lines 37-40), and the flushed zone being a region of formation invaded by drilling fluid (page 3, para 35, lines 11-20).

Regarding claim 32, the method taught by Ritter et al. includes calculating a standoff distance (column 3, para 13, lines 26-27) from the resistivity measurements in which the standoff distance is a region between the measurement device and the borehole wall 27.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-9 and 12-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zoltan et al. in view of Applicant Admitted Prior Art (AAPA).

With regards to claims 2 and 18, Zoltan et al. discloses the claimed invention as explained above. Zoltan et al. does not specifically disclose that the first electrode is a current emitting electrode. However, the applicant admits that the only difference between the present invention and the prior art is the addition of one electrode (page 8, lines 18-21). Therefore it is implied that the prior art design of Fig. 1A functions in the same manner as the present invention up to the extent of the need and utility of the sixth electrode. Claim 2 requires the need for only three electrodes. The device of the AAPA is explained to include a first electrode that emits a current, a fifth electrode acting as a current return, and a second electrode to measure a voltage corresponding to the current. It would have been obvious to one of ordinary skill in the art to use the electrode functions of the AAPA with the device taught by Zoltan et al. because that is a well known and admitted procedure for measuring resistivity of the surrounding formation.

Similar reasoning applies to claims 4 and 20. Since claims 4 and 20 only requires the use of five electrodes, the device of the AAPA would be adapted such that

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the first electrode emit a first current, the fourth electrode emit a second current, the fifth electrode acts as a current return for the first and second currents, and the first and second currents minimizes a voltage between the second and third electrodes. It would have been obvious to one of ordinary skill in the art to use the electrode functions of the device of the AAPA with the device taught by Zoltan et al. because switching the electrodes would provide the same function of measuring the surrounding formation.

Regarding claims 7, 9, 23 and 25, Zoltan et al. teaches a microresistivity device comprising a seventh electrode **24** outside of the sixth electrode **10** which functions as a current return (the electrode 24 is connected to the output of two current generators, column 10 lines 18-19 and column 10 lines 28-29). As explained above, the first electrode of the AAPA emits a combined first and second current. By the same reasoning, the fourth electrode is a current return as well and the first and second currents will minimize the voltage between the fifth and sixth electrodes to zero. It would have been obvious to one of ordinary skill in the art to use the electrode functions of the AAPA with the microresistivity device taught by Zoltan et al. to enable resistivity measurements of the flushed zone.

Similar reasoning applies to claims 12, 14, 26, and 28 since these claim requires the same electrodes required in claims 7, 9, 23 and 25 only with different functions. It would have been obvious to one of ordinary skill in the art to use the electrode functions of the device of the AAPA with the device taught by Zoltan et al. because switching the electrodes would provide the same function of measuring the surrounding formation.

Regarding claim 3, 5, 6, 8, 13, 19, 21, 22, 24 and 27 it is well known in the art that the voltage measured by the microresistivity device disclosed by Zoltan et al., is linearly proportionate to the resistivity of the surrounding formation and that the resistivity is inversely proportionate to the magnitude of the current (Ohm's law, $V=IR$).

Regarding claims 15, 16, 17, and 29 Zoltan et al. teaches a microresistivity tool comprising a tool body having a length (everything more than a point has a length) in which the tool body is a pad (column 9 lines 34-38) and a set of electrodes on the tool body, the set of electrodes including a first electrode, a second electrode, a third electrode, a fourth electrode, a fifth electrode, and a sixth electrode arranged linearly with respect to the length. Zoltan et al. does not disclose having a first electrode acting as a current source or having a pair of electrodes short circuited together to provide a compensated measurement. However, the device of the AAPA is explained to have the first electrode emit current and would be adapted to have a pair of electrodes short circuited together to provide a compensated measurement. It would have been obvious to one of ordinary skill in the art to use the electrode functions of the AAPA with the device of Zoltan et al. because that is a well known and admitted procedure for measuring resistivity of the surrounding formation.

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter et al. in view of Fabris et al. {6,801,039}. The method for measuring multiple resistivities in a borehole taught by Ritter et al. does not include a ratio greater than ten thousand between the flushed zone resistivity and a resistivity of the drilling fluid. However, the

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method using the device of Fabris et al. shows an accurate sensing measurement even when the ratio of the flushed zone (formation) resistivity to the drilling fluid (mud) resistivity exceeds ten thousand **Fig. 7**. It would have been obvious to one of ordinary skill in the art to use the method step displayed by Fabris et al. with the method taught by Ritter et al. because it allows for higher sensitivity in measurements.

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter et al. in view of Zoltan et al. Ritter et al. does not disclose using seven electrodes for the measurement device. However, Zoltan et al. discloses a resistivity measurement device that includes seven electrodes. It would have been obvious to one of ordinary skill in the art to use the seven electrodes with the device taught by Ritter et al. because more measuring electrodes would allow for more measurements to be taken at additional distances resulting in a more accurate resistivity measurement of the flushed zone.

Allowable Subject Matter

Claims 10 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 5570024 and US Pub 2002/0101242 both disclose tools for measuring multiple resistivities inside a borehole.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tyrone Jackson

8/17/2005



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